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NOTES AND COMMENTS.

RECENT PHOTOGRAPHIC INVENTION.

NO ONE who reads the daily papers can fail to have seen accounts of the "new photography," as it is called.

Just what name to give to this wonderful discovery we cannot yet decide upon. Sticklers for exactitude in nomenclature will remember that even the word "photography" is rather a misnomer. It literally means writing by light, and not picture-making by light. Custom, stronger than law, has nevertheless been content with the word, and there are many scientific and other terms and names far worse in their etymology.

As if to throw into the shade entirely such wonders as photographing invisible planets, and researches into the ultra-violet regions of the solar spectrum, the new process may claim the unique position of delineator of the invisible in general. Such experiments as photographing the metal shafts of knife handles, through the wood or bone, or coins concealed in closed wallets, are now elementary. We see very accurate pictures of bullets lodged between the bones of the lower leg, or of the bony structure of living hands, or even of whole skeletons of small animals, taken through the flesh. It is not to be wondered at that the majority of investigators are hard at work developing the capabilities of the new art in surgery and medicine. From metallurgists we do not hear a great deal and it must be admitted that we have yet much to look forward to from them. For, unfortunately, the common metals, iron and steel (the latter particularly), are very impervious to the new actinism, while less useful ones, like silver, brass and aluminum, are much more *transparent;* we can now actually use such apparent contradictions in terms. Glass, the type of transparent substances, resists the new rays like so much wood. A photographic plate-holder, with glass doors, would be a curiosity, and yet not wholly useless for the new process. The homogeneous structure of such metals as are penetrable by the X rays, as they are called, is well detailed. All the ornaments and lettering, as well as concealed flaws, cracks, etc., in the coins hitherto experimented upon, have been quite distinctly rendered. Eminent authorities in gunnery have expressed their belief in the powers of the new art to reveal hidden defects in expensive gun-forging. A process so sensitive to variations in molecular structure might be expected to render a differentiation between wrought-iron, cast-iron and cast-steel; but as yet we have only very meagre data in this connection. With more powerful sources of actinism, and with photographic chemicals and plates prepared for this express purpose, we may yet be able to realize such triumphs of useful picture-making as the revealing of dangerous flaws in bridge beams or in the shafts of sea-going steam vessels.

Photography, like other arts, has curiosities of its own, and we will here mention one of the less well known phenomena (yet one properly belonging to the subject), namely, that some of the sensitive substances ordinarily used will respond to other agencies than light, giving images which are, to say the least, recognizable. A case from the writer's own practice will make this clearer. A plate had been exposed on the interior of a public building and on development showed a strange doubled or confused outline near the centre. Close examination revealed part of a landscape taken years before on the same glass. A sufficient number of prints having been made from the landscape negative, the glass was thoroughly cleaned by first removing the film with several hours soaking in caustic alkali, and then by prolonged soaking in dilute nitric acid according to the common custom of photographers. A free washing and drying of the glass plate was then followed by polishing of the surface. So then on preparing the plate to take the interior view no doubt of its absolute chemical cleanliness could be entertained, and yet so persistent was the impression of the older picture on the surface of the glass that the application of fresh photographic material *redeveloped* the old image. Here then we have an image produced by the joint action of a developer and a special condition of the surface of the supporting medium—quite independently of light. English scientists have written accounts of the action of shearing-stress upon the sensitive salts of silver. Others have told how the mere contact of certain foreign substances upon a film of iodide of silver will impress an image capable of being developed.

Thus we see that images can be formed on sensitive material independently of light. The term photography here would be the worst of misnomers, and such a word as "actinography" is preferable.

The manner in which the new pictures have been made is highly interesting. As might be supposed, the absence of light entails the employing of special apparatus. Its arrangement is briefly as follows: The photographic plate remains in its "holder" or dark-slide with the door (of wood ebonite or carton) closed. The object such as a nut, lead-pencil, knife, carcass of a mouse, etc., is brought up close to or touching the door of the plate-holder, which is then set at a few inches distance from a Crooke's vacuum tube. This latter may be called a sort of greatly improved outgrowth from the old familiar "aurora borealis tube" in the early days of electricity, when the generators were wine bottles from which the glory had departed, set on an axle and revolved against buckskin rubbers dusted over with scrapings from the backs of old mirrors. To be more precise, the celebrated English chemist's name has been applied to that form of high vacuum tube in which the energy or force from the negative pole is utilized to the exclusion of that from the anode or positive. The term *Cathode Photography* is a good one for the new pictures, inasmuch as it directs attention to the special agency by which they are made. Camera and lens are both dispensed with.

Seeing that this wonderful art has only been known to the world a few weeks and that a chief difficulty besetting investigators is the want of proper kinds and sufficient numbers of vacuum tubes, we must for the present content ourselves with speculations as to its future uses. We do not hesitate to call it one of the great discoveries of the century. Nor do we fail to foresee the incalculable help that it will be in some kinds of medical and surgical diagnosis. It is not fair to expect it to accomplish too much in deep-seated portions of the body. We have every reason to believe that fractures of the bony processes of the lumbar vertebræ, for example, or of the ribs which articulate with them, or, say, dislocations at or near those points, or the lodgment of bullets, etc., in that region (as happened in the case of the late lamented President Garfield) will be revealed by the new process and help the surgeon enormously. But supposing that we wanted to penetrate just a little deeper, say somewhere around the solar plexus of nerves, we could not expect good results when so many layers of tissues of different densities overlay the point to be examined. Even the heart enclosed in its pericardium might perhaps be too deep-seated; while again we might expect fair images of the surfaces of the lungs, of the pleuræ, perhaps of pneumonic consolidations and pleuritic adhesions—the latter almost certainly if they were of good size, and, of course, the effusions of pleurisy : in brief, *anything not covered up by too many layers of important tissue which itself might be diseased or injured.* We already have details of such cases as a sewing-needle sunk in the bone of the finger, and of abscess in the jawbone being made *visible to the eye* by proper lighting. And when we remember that small but powerful electric lights are being constantly introduced into the mouth, stomach and rectum for clinical examination, so that we can command a distinct source of actinism in the cavities of the body to assist what is already on the exterior, we feel disposed to share with the most enthusiastic in looking forward to what the new art will do for suffering humanity. In the one immense field of gunshot injuries (particularly superficial ones) we indulge most sanguine expectations.

Those familiar with ordinary photography will naturally inquire about the time of exposure. It is of course out of the question to answer such a question with precision, but the time is relatively long, say from a quarter of an hour to two or more hours with ordinary commercial plates.

ELLERSLIE WALLACE, M. D.

WOMAN'S WAGES.

THREE causes have much to do with the price a woman is offered for her work.

First is the survival of old notions about women's business incapacity. People do not yet think straight and see clear.

Again, competition is sharp among women. They underbid one another. Workers for money that is to serve only as pin money can work for less than the one who must buy food and shelter and clothes.

Thirdly, women can, or will, live on less than men. That has much to do with holding down their wages.

The following example will serve to illustrate other reasons. An editor employed the best type-writer in Boston. She had been victorious in competitive effort. Before she came to him she had been employed in a wholesale dry-goods house at fifteen dollars a week. In her place the firm took a young man, in no wise a better type-writer, and paid him twenty-five dollars a week. Now they would not purposely waste ten dollars a week. Why did they think it economical to pay the man more ?

He was not a dependent relative whom the firm was willing to contribute to. They did not think a man to be a better worker merely because he was a man—an opinion boards of regents and trustees often hold (the school-